Original Article

ETIOLOGY OF PERITONITIS AND FACTORS PREDICTING THE MORTALITY IN PERITONITIS

Jeetendar J Paryani[1], Vikas Patel[1], Gunvant Rathod[2]

Financial Support: None declared

Conflict of interest: None declared

How to cite this article:
Paryani JJ, Patel V, Rathod G. Etiology of Peritonitis and Factors Predicting the Mortality in Peritonitis. Natl J Community Med 2013; 4(1): 145-8.

Author's Affiliation:
[1]Resident; [2]Professor, Department of Surgery, Civil Hospital, Ahmedabad, Gujarat

Correspondence:
Dr. Jeetandar Paryani,
Email id paryani.jeetu@gmail.com

Date of Submission: 12-01-13

Date of Acceptance: 01-03-13

Date of Publication: 31-03-13

ABSTRACT

Introduction: Peritonitis is a life threatening surgical emergency that requires prompt and optimum surgical attention. This study aims to describe the different factors affecting the final outcome of the patient.

Materials and methods: A retrospective study of hospital records was done on 60 patients who underwent alaparotomy for treatment of peritonitis in the month of January and February 2012at Civil Hospital and B. J. medical college.

Results: Out of 60, 16 patients died (26.7%). The most common etiology was peptic perforation (50%); the most mortality was also for peptic perforation (8/16, 50%). Factors causing adverse outcomes were extremes of age ($p < 0.05$), delay in presentation to hospital, tachycardia, and hypotension extremes in total count (septicemia) and altered renal function ($p < 0.01$).

Conclusion: The mortality rate (26.7%) of peritonitis is quite high. The late presentation to the hospital--a very important cause of adverse outcome in patients, leads to deterioration of patients. Tachycardia, hypotension, renal failure and septicemia are the factors significantly predicting death (each significant at 1%). Thus if patients could be detected early having above mentioned symptoms and prompt treatment could be provided; mortality can be reduced.

Key words: Peritonitis, Peptic perforation, Tachycardia, Hypotension.

INTRODUCTION

Peritonitis is inflammation of peritoneum which is most commonly due to generalized or localized infection. Peritonitis may be primary or secondary. Primary peritonitis rarely requires any surgical treatment. Secondary peritonitis can be due to perforation of bowel which results in contamination of peritoneal cavity with contents of bowel and bacterial colonization depending on site of perforation. It results in rapidly fluid loss into 3rd space and sepsis. The body responds in form of inflammatory response resulting in leukocytosis with shift towards left, release of cytokines and other mediators. All the factors mentioned above when unattended push the patient towards septic shock[1].

It is the most common surgical emergency in India[1]. Despite modern surgical techniques, antimicrobial therapy and intensive care support, management of peritonitis continues to be highly challenging task demanding proper knowledge, experiences, continued care and close monitoring. The etiology of perforation in India continues to be different from that of western countries where most commonly peritonitis occurs due to lower GI perforations as

diverticulitis is more common whereas in our settings upper GI perforation especially peptic perforation is more common[2].

High morbidity and mortality resulting from delayed presentationexpresses a gap that can be filled by improvement in care through a better ability to recognize and treat peritonitis[3]. Therefore, the objectives of this study are to determine the etiology,physical and laboratory findings and assess their correlation to mortality in case of peritonitis.

METHODS

Study setting: The study was conducted at the Civil hospital and B.J Medical College, Ahmedabad after obtaining approval from institutional ethical committee. It is a tertiary referral center catering to referrals from entire state of Gujarat, Madhya Pradesh and Rajasthan.

Data collection: Patients admitted to Civil Hospital, Ahmedabad who underwent an operation for treatment of peritonitis during the calendar month of January and February 2012 were enrolled in the study after obtaining informed consent. Peritonitis was defined as guarding (localized or generalized), rigidity or rebound tenderness.Wetracedthe patients retrospectively through a review of operative log book of the emergency operation theatre and medical records of those patients obtained through record section.Variables such as gender, age, duration of symptoms, date of admission and discharge or death, surgical procedure and operative diagnosis, vital signs on presentation (including heart rate (HR), systolic blood pressure (BP), and respiratory rate (RR), presence of guarding), date and results of initial complete blood count and abdominal ultrasound if performed were considered.

Analysis of data: We calculated the descriptive statistics for our variables such as operative diagnosis, overall and diagnosis-specific mortality rates, age, time (in days) from onset of symptoms, outcome, presenting vital signs including systolic BP (< 100mmhg, 100 to 120mmhg, and > 120mmhg), RR (< 30/min, ≥ 30/min), HR (< 100/min, 100 to 120/min, and > 120/min), total count (TC) (< 4000/dL, 4000 to 12000/dL, > 12000/dL), Creatinine (< 1.5mg/dL, ≥ 1.5mg/dL) and presence or absence of free fluid.

The above variables were compared in two groups: expired (group A) and survived (group B). Chi-square (χ^2) test was used to compare variables and tests were considered significant when P-Value < 0.05.

RESULTS

In the present study, 60 patients studied were divided in two groups: Group A included those who expired (27% = 16/60) and Group B included those who got discharged (73% = 44/60). The mean and median ages were 45.5±4.2 and 44 yearsrespectively and the range was 14-90 years.Table 1 indicates that Peptic perforation (50%) was the most common etiology with highest rate of overall mortality (8/16, 50%).

Table 1: Distribution of patients according to Etiologies

Type of Infection	**Expired**	**Discharged**
Traumatic jejuna perforation	0 (0)	4 (7)
Peptic perforation	8 (13)	22 (37)
Perforated appendix	2 (3)	2 (3)
Acute intestinal obstruction due to adhesive band	0 (0)	2 (3)
Rectal perforation	0 (0)	4 (7)
Ruptured liver abscess +ascending colon perforation	2 (3)	0 (0)
GB perforation	2 (3)	2 (3)
Acute intestinal obstruction +sigmoid volvulus	2 (3)	0 (0)
Acute intestinal obstruction +obstructed right inguinal hernia	0 (0)	2 (3)
Others	0 (0)	6 (10)
Total	16 (27)	44 (73)

Table 2 shows factor that affect survival. Age and Symptoms duration have significant effect on mortality at 5% (p = 0.0400, p = 0.0048). Mortality rate was highest in the age group < 20 years; symptoms durations ≥ 2days increased the mortality rate from 0% to 36%. Vitals—HR, BP, and RR all have significant effect on mortality at 1% (p = 0.001, p = 0.0002, p = 0.0001). HR >

120/min, BP < 100mmhg, and RR ≥ 30/min was fatal for the patients (mortality rate 67%, 80%, and 67% respectively). Similarly investigations – TC <4000/dL and >12000/dL, Creatinine ≥1.5mg/dL, and Free fluid also have significant effect on mortality at 5% (p = 0.0153, p = 0.0038, p = 0.0036).

Table 2: Factors Affecting Mortality

Factor	Expired (n = 16)	Discharged (n = 44)	P-value
Age			
< 20 years	4 (67)	2 (33)	0.0400**
20- 50 years	6 (18)	28 (82)	
> 50 years	6 (30)	14 (70)	
Symptoms Duration			
≤ 2 days	0 (0)	16 (100)	0.0048**
≥ 2 days	16 (36)	28 (64)	
Heart Rate			
< 100/min	2 (11)	16 (89)	0.0017***
100 to 120/min	6 (20)	24 (80)	
> 120/min	8 (67)	4 (33)	
Blood Pressure			
< 100mmhg	8 (80)	2 (20)	0.0002***
100 to 120mmhg	6 (18)	28 (82)	
> 120mmhg	2 (13)	14 (88)	
Respiratory Rate			
< 30/min	8 (17)	40 (83)	0.0001***
≥ 30/min	8 (67)	4 (33)	
Total Count			
< 4000/dL	2 (50)	2 (50)	0.0153**
4000 to 12000/dL	6 (15)	34 (85)	
> 12000/dL	8 (50)	8 (50)	
Creatinine			
< 1.5mg/dL	6 (15)	34 (85)	0.0038**
≥ 1.5mg/dL	10 (50)	10 (50)	
Free Fluid			
Absent	0 (0)	10 (100)	0.0367**
Present	16 (32)	34 (68)	

***Significant at 1%, **Significant at 5%

DISCUSSION

Peritonitis is a commonly encountered surgical emergency in developing countries like India[4, 5]. In most of cases the presentation to the hospital is delayed with well-established generalized peritonitis. Thus purulent/faecal contamination leads to varying degree of septicaemia. The signs and symptoms are typical making it possible to make a clinical diagnosis of peritonitis in nearly all patients.

The perforations of proximal gastrointestinal tract were significantly more common compared to other aetiologycontrasting to studies from developed countries like United States, Greece and Japan which revealed that distal gastrointestinal tract perforations were more common.[1, 4, 5, 6].

Proximal bowel perforation is mainly on the decrease in the developed nations because of adoption of therapies against Helicobacter pylori. Also better availability of proton pump leads to better ulcer relief and healing leading to decreased progression of peptic ulcer disease. Distal bowel perforations especially colonic perforations are leading cause of perforation peritonitis in the western world [7].

Etiology and site of perforation also affects the outcome. Gastro duodenalperforation occurring mainly due to peptic perforation is most common cause which accounts for major mortality in developing nations [4, 5, 6]. Also, the occurrence of peptic perforation is mainly in the older age group. Post-operative occurrence of abdominal abscesses and pneumonia is common which contributes to morbidity and then mortality[8]. Occurrence of higher risks of pneumonia can be explained by upper abdominal operation.Also the higher output of proximal GI tract as compared to lower GI tract may be another reason for the higher mortality[9].

Age is important predictor of outcome; with extremes of age groups the body tolerance to insult caused by peritonitis is reduced which shows in the study as there is significantly high mortality in those age groups. Physiological limitations of human body increase with age in terms of cardiovascular respiratory and renal systems. Such comorbid conditions may be present in about two thirds of such patients[10].

Hypotension and tachycardia also indicate poor prognosisas the perfusion to the tissues is reduced which is confirmed by this study[6]. So, preoperative aggressive management of these patients in the emergency unit decreases the ASA grade of the patient and is associated with better outcomes[9].

Septicaemia (TC<4000/dL or TC >12000/dL) indicates that insult of peritonitis has made the general state as hyper catabolic state thus significantly reducing the survival rate. Most important of all; the majority of our patients came late to the hospital (after2 days of the appearance of symptoms) and succumb to death;Either they ignored the earlier symptoms, or had taken medicinal care for local health facility, or were located in places far from centres with surgical facilities,so had to travel long distances to reach a referral centre.

Delayed presentation also leads to septicaemia and thus reduces the survival rate[9]. Also it leads to widespread dissemination of the insult leading to more generalised peritonitis making the control of pathology difficult and resulting in poor intraoperative outcome [12]. It could be regarded as the most important factor predicting in the prognosis of peritonitis especially peptic perforation[13].

Future research could be done to evaluate whether preoperative correction of above mentioned statistically significant factors improves survival, and which canbe done by comparing data from Government hospitals and Private hospitals in periphery.

CONCLUSION

Peritonitis is one of the commonest emergencies in surgical department. And delayed presentation significantly adds to the mortality. An aggressive preoperative evaluation and steps to correct deranged homeostasis, an early surgery and vigilant postoperative care are the keys to avoiding postoperative mortality in such patients.

REFERENCES

1. Sanjay Gupta ,Robin Kaushik , Peritonitis the eastern experience , World journal of emergency Surgery 2006 ;1:13
2. Rajender S Jhobta et al , Spectrum of perforation peritonitis in India review of 504 consecutive cases, World Journal of Emergency Surgery 2006, 1:26
3. Ranju Singh , Nishant kumar , Abhijit Bhattacharya , Homay Vajifdar, Preoperative predictors of mortality in adult patients with perforation peritonitis, Indian Journal of Critical Care medicine 2011
4. Shahida Parveen Afridi, Faiza Malik, Shafiq Ur-Rahman,Shahid Shamim,Khursheed A Samo, Spectrum of perforation peritonitis in Pakistan: 300 cases Eastern experience, World Journal of Emergency Surgery 2008, 3:31
5. Dinesh Yadav & Puneet K. Garg Spectrum of Perforation Peritonitis in Delhi: 77 Cases Experience Indian J Surg DOI 10.1007/s12262-012-0609-2
6. Jonathan C Samuel et al , An Observational Study of the Etiology, clinical presentation and outcomes associated with peritonitis in Lilongwe, Malawi, World J Emerg Surg. 2011; 6: 37
7. Mark A Malangoni , Tazo Inui,Peritonitis – the Western experience World Journal of Emergency Surgery 2006, 1:25
8. Naoto Fukuda,Joji Wada,Michio Niki,Yasuyuki Sugiyama,Hiroyuki Mushiake, Factors predicting mortality in emergency abdominal surgery in the elderly, World Journal of Emergency Surgery 2012, 7:12
9. P. Kujath, O. Schwandner,H.-P. Bruch, Morbidity and mortality of perforated peptic gastroduodenal ulcer following emergency, Langenbecks Arch Surg (2002) 387:298–302
10. Ahmer A Memon, Faisal G Siddiqui, Arshad H Abro, Ahmed H Agha, Shahzadi Lubna Abdul S Memon, An audit of secondary peritonitis at a tertiary care university hospital of Sindh, Pakistan World Journal of Emergency Surgery 2012, 7:6
11. J. O. Larkin ,R. Waldron, M. G. Bourke, K. Barry, A. Muhammed ,P. W. Eustace Mortality in perforated duodenal ulcer depends upon pre-operative risk: a retrospective 10-year study, Ir J Med Sci (2010) 179:545–549
12. N. Torer, K. Yorganci, D. Elker, I. Sayek, Prognostic factors of the mortality of postoperative intraabdominal infections, Infection (2010) 38:255–260
13. Michael Imhof, Stefan Epstein,Christian Ohmann,Hans-Dietrich Ro¨her: Duration of Survival after Peptic Ulcer Perforation World J Surg (2008) 32:408–412.